AORTIC ENDOGRAFT FAILURE MODES:
STRATEGIES FOR PREVENTION AND SALVAGE

HYBRID APPROACH TO TREAT TYPE 1 ENDOLEAKS

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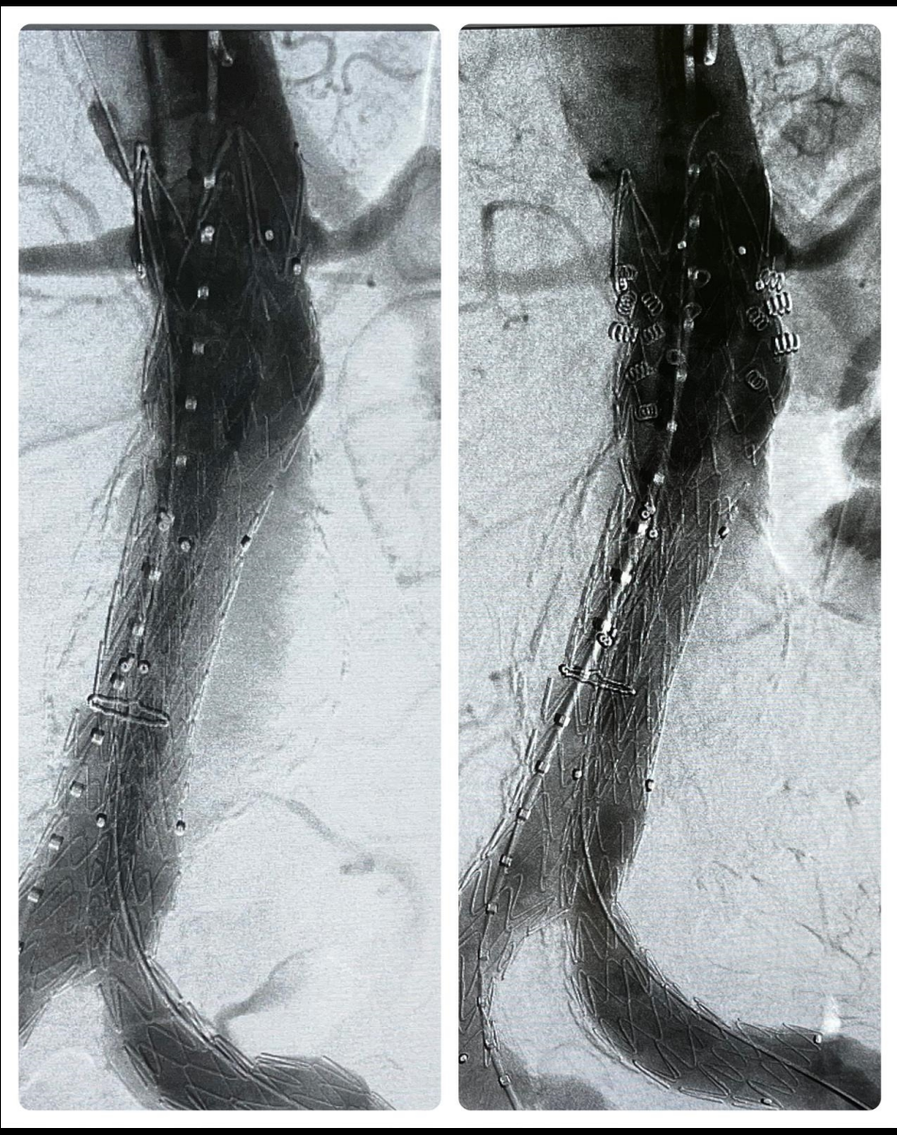
NO CONFLICTS OF INTEREST

EVAR FACTS

Widely accepted particularly when cardiovascular comorbidities make open repair high-risk



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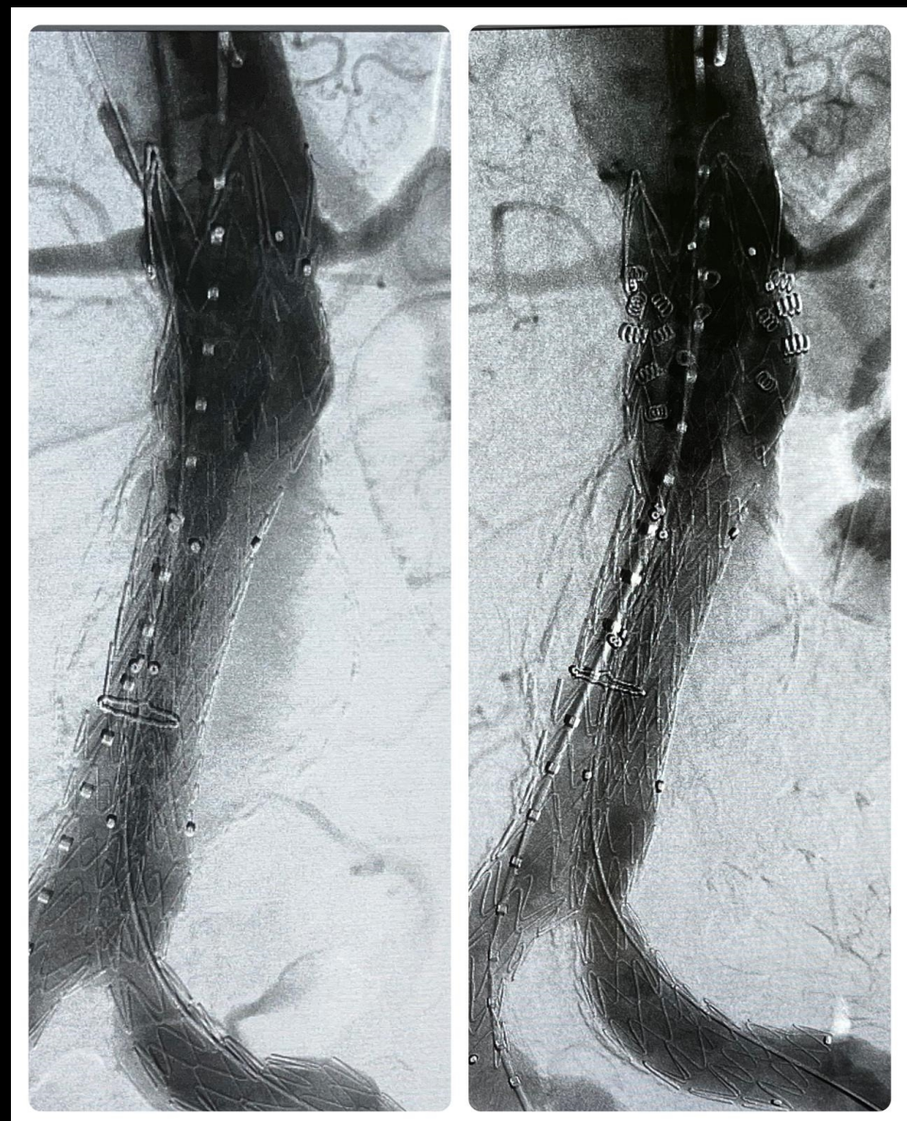
Requires sac exclusion from systemic circulation. Failure may result in EL, sac expansion and rupture



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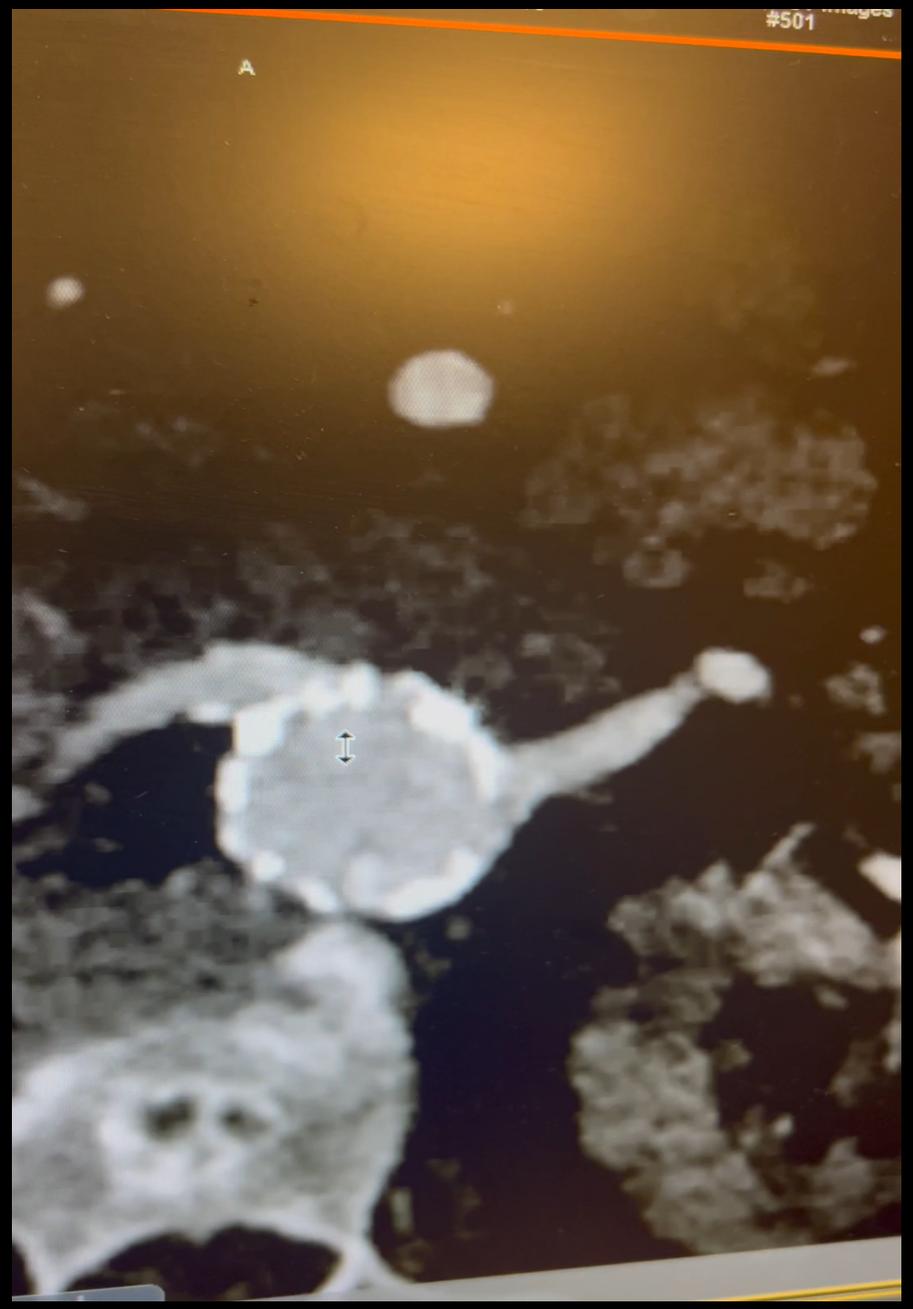
Type Ia EL (T1EL; persistent perigraft blood flow caused by inadequate proximal seal) has strong association with sac expansion and rupture



BACKGROUND

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Society for Vascular Surgery

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Alternative strategy with open repair + stent preservation: lower mortality

PRESENTATION

Three patients with T1EL underwent *hybrid* revision (two elective; one emergent), using sutures proximally to achieve graft preservation and sac exclusion

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TECHNICAL NOTE

Hybrid Management for Anterior Nutcracker Syndrome: Left Renal Vein Stenting with Laparoscopic Stent Exofixation

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Introduction: Left renal vein stenting (LRVS) for the treatment of anterior nutcracker syndrome (NCS) has been associated with a significant risk of stent migration into the inferior vena cava or right ventricle.
Surgical technique: A hybrid technique is reported for the treatment of NCS to prevent stent migration. The first part of the procedure consists of LRVS at the level of the aortomesenteric compression. The second part consists of laparoscopic stent exofixation through a transperitoneal direct approach. The left renal vein is exposed in order to visualise the stent meshes through the venous wall. Stent exofixation in performed with a simple transfixing polypropylene stitch, reinforced with a Teflon pledget.
Discussion: The hybrid treatment of anterior NCS combining laparoscopic stent exofixation with left renal vein stenting is a simple and low morbidity technique. Further follow up data are needed to evaluate its potential benefit in reducing the risk of left renal vein stent migration.

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Keywords: Laparoscopic stent exofixation, Left renal vein stenting, Nutcracker syndrome, Stent migration

CASE ONE - ELECTIVE

83-year-old male: 23-mm Ovation graft for 6.8-cm AAA 2 years prior

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2-month postoperative CT - possible unclassified EL without sac changes. Duplex every 6 months

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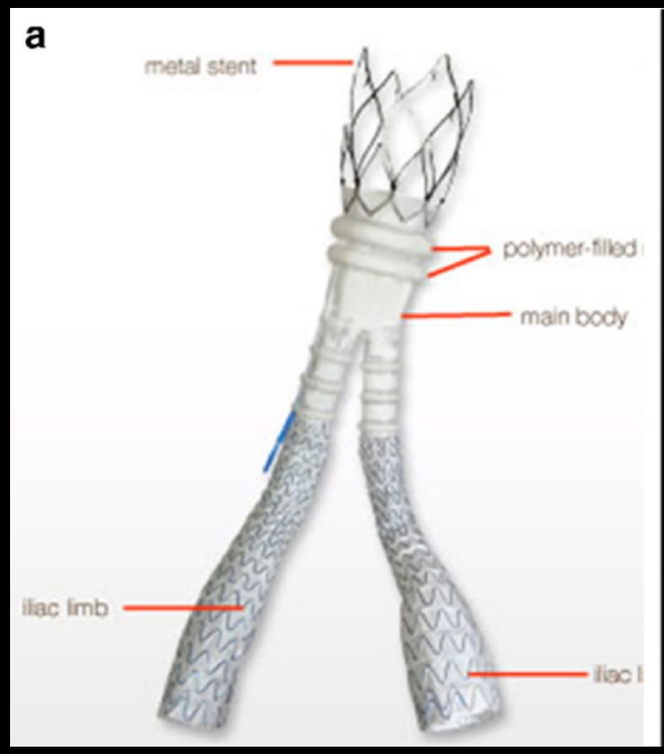
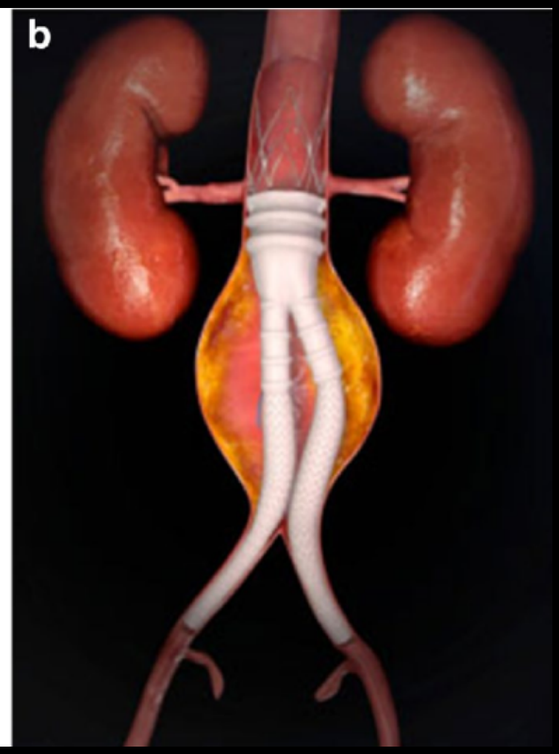
Aortogram and surgical revision vs graft explant

CASE ONE

Because of polymer ring, we practiced ex-vivo suturing through immediate graft area for feasibility





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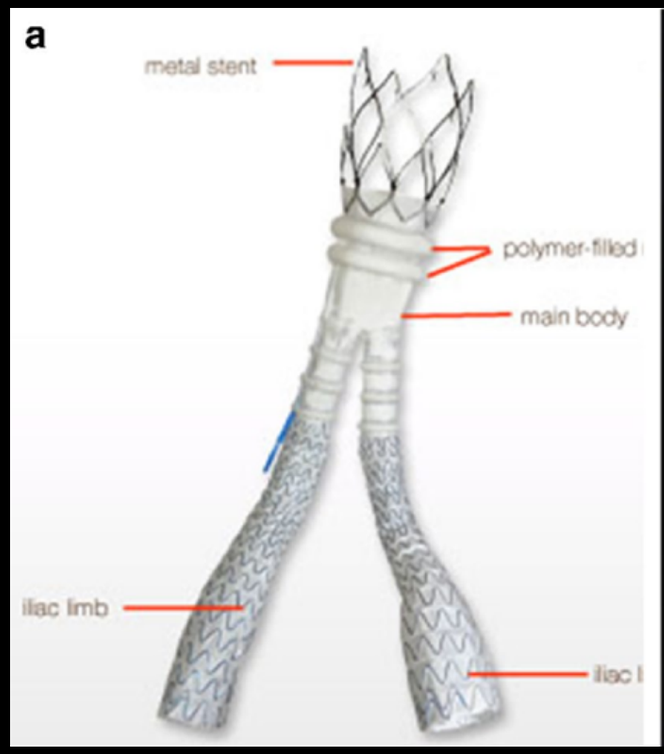
Polymer rigidity makes explant difficult. Possible by retroperitoneal, very proximal clamping above stent struts, and graft transection above polymer ring. Undisturbed suprarenal struts left in situ



CASE ONE

Angiography confirmed T1EL

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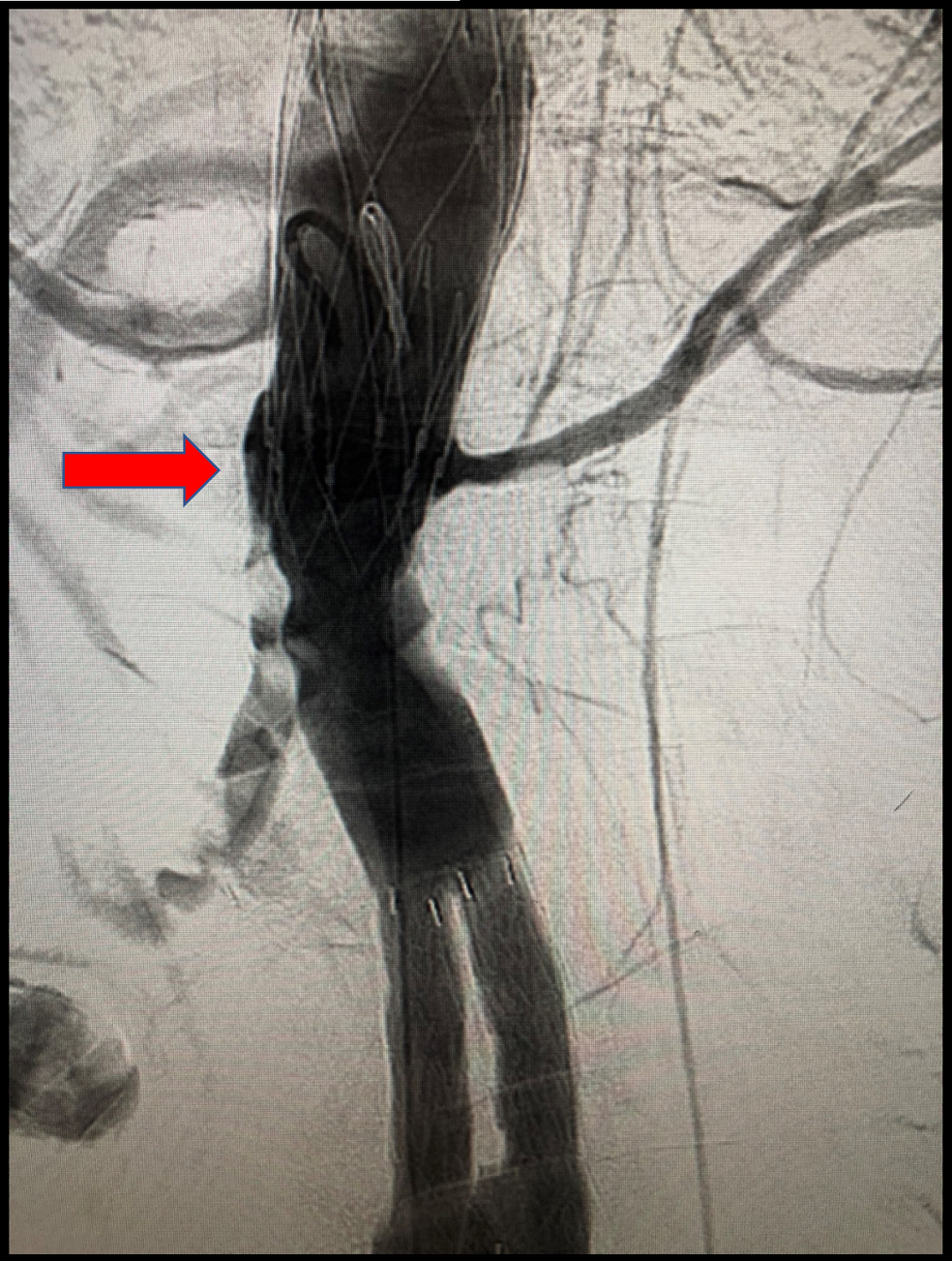
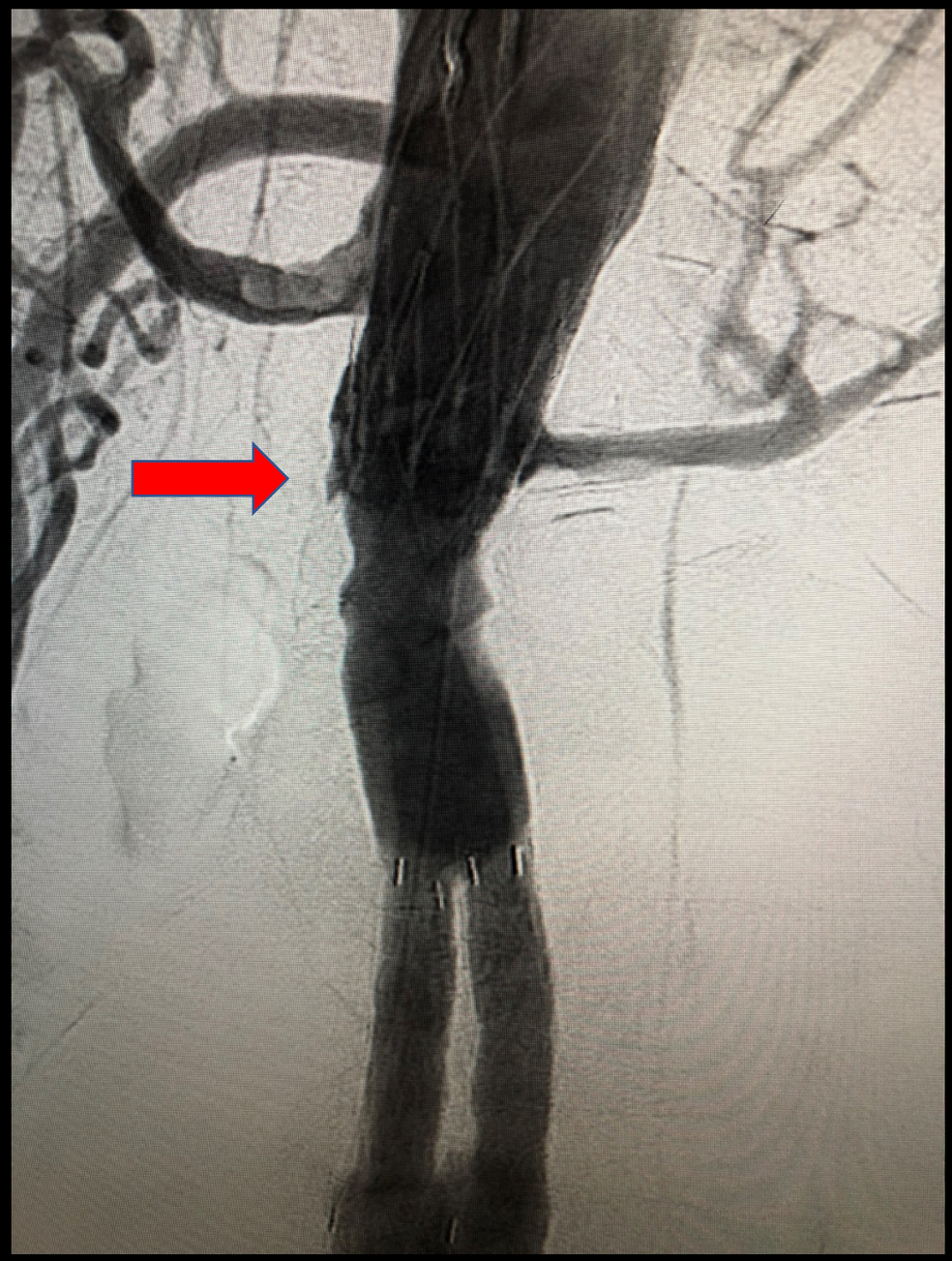
Open limited retroperitoneal neck exposure. Circumferential neck dissection and interrupted horizontal mattress 3-0 Prolene sutures reinforced with Teflon pledgets placed from 10 o’clock coursing anterior medially to 2 o’clock (area of concern on CTA and angiography)

CASE ONE





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Discharged to SNF POD#8

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Follow-up duplex 7 days after showed no EL and sac shrinkage to 6.8 cm

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12-month Duplex showed continued shrinkage and no EL

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86-year-old male EVAR - Cook Zenith stent + endoanchors for enlarging AAA

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Angiography and open proximal revision was done 2 months post EVAR

CASE TWO

Angiography suggested that peri-renal anatomy would not allow enough cuff expansion for renal cannulation (very small diameter and calcified neck, findings appreciated at time of case planning but felt not to be prohibitive)

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Interrupted horizontal mattress sutures of 3-0 Prolene reinforced with Teflon pledgets placed around the entire neck including native aorta and proximal stent segment

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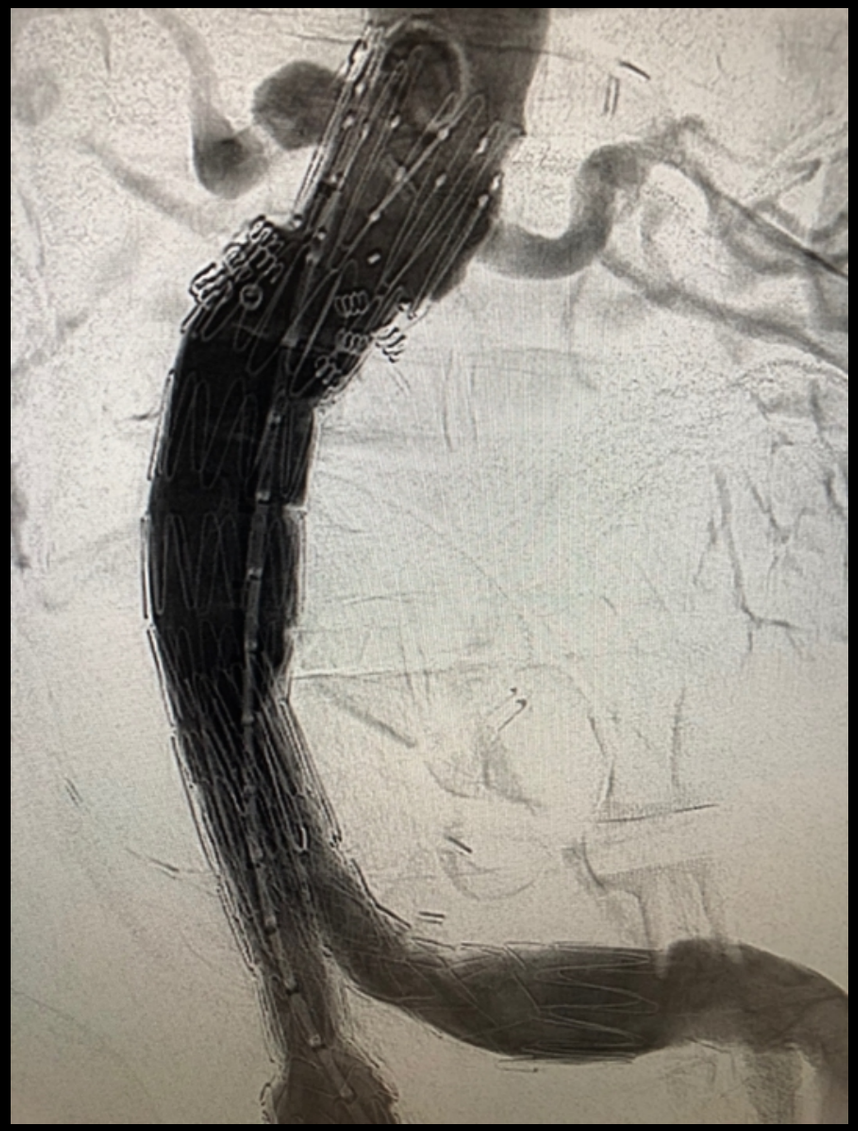

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Uneventful postoperative course. Discharged home on POD#4

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Follow-up CTA 1 month postoperatively showed sustained neck exclusion with no EL

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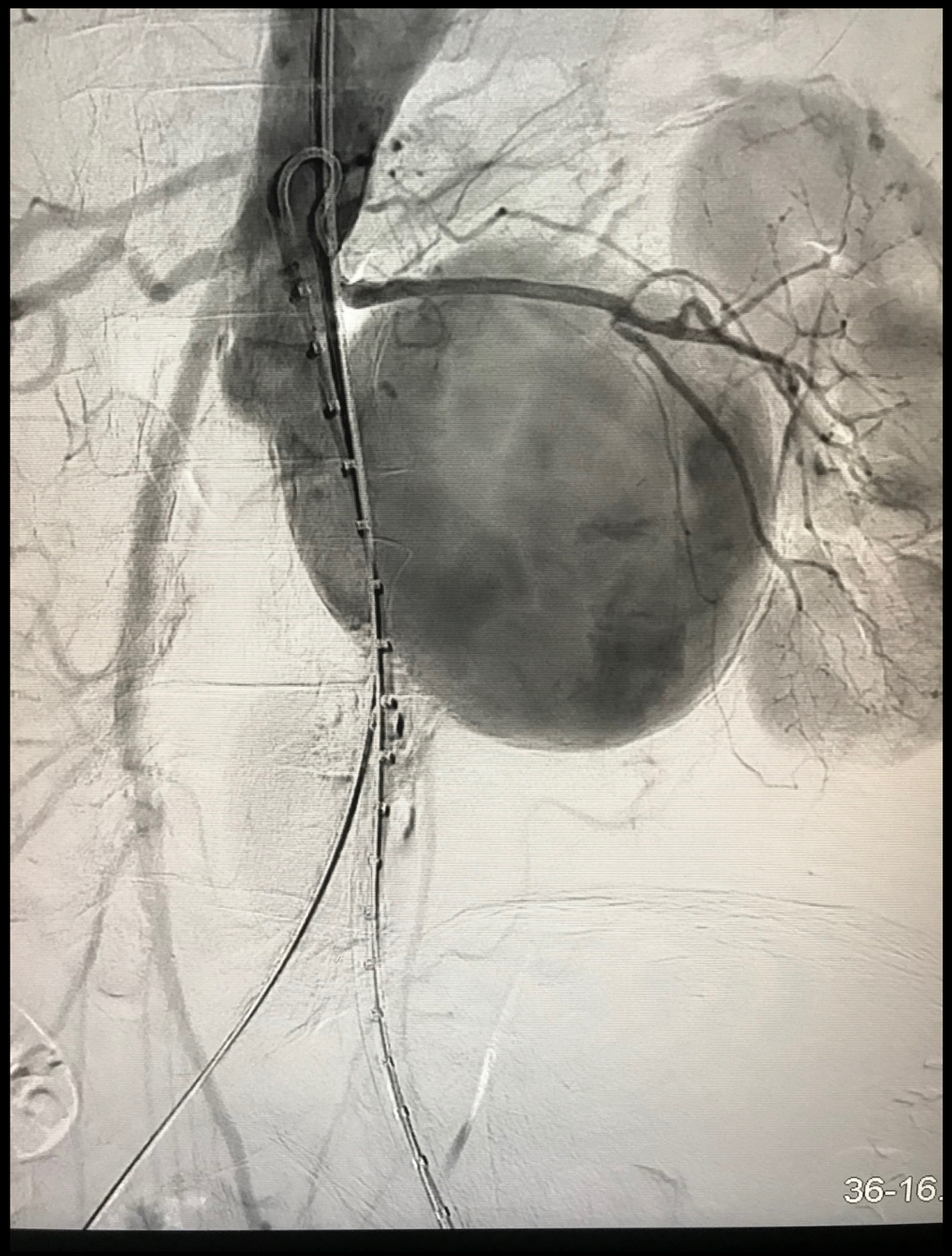
Patient died from lung cancer 8 months postoperatively

CASE THREE - EMERGENT

89-year-old otherwise healthy female - ruptured 8-cm infrarenal AAA, transferred to our facility



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Persistent T1EL despite endoanchors

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Midline small laparotomy for open conversion (patient extremely thin) and aorta exposed transperitoneally

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Bilateral common femoral thrombectomies and patch angioplasties for occlusive disease and embolization was also needed

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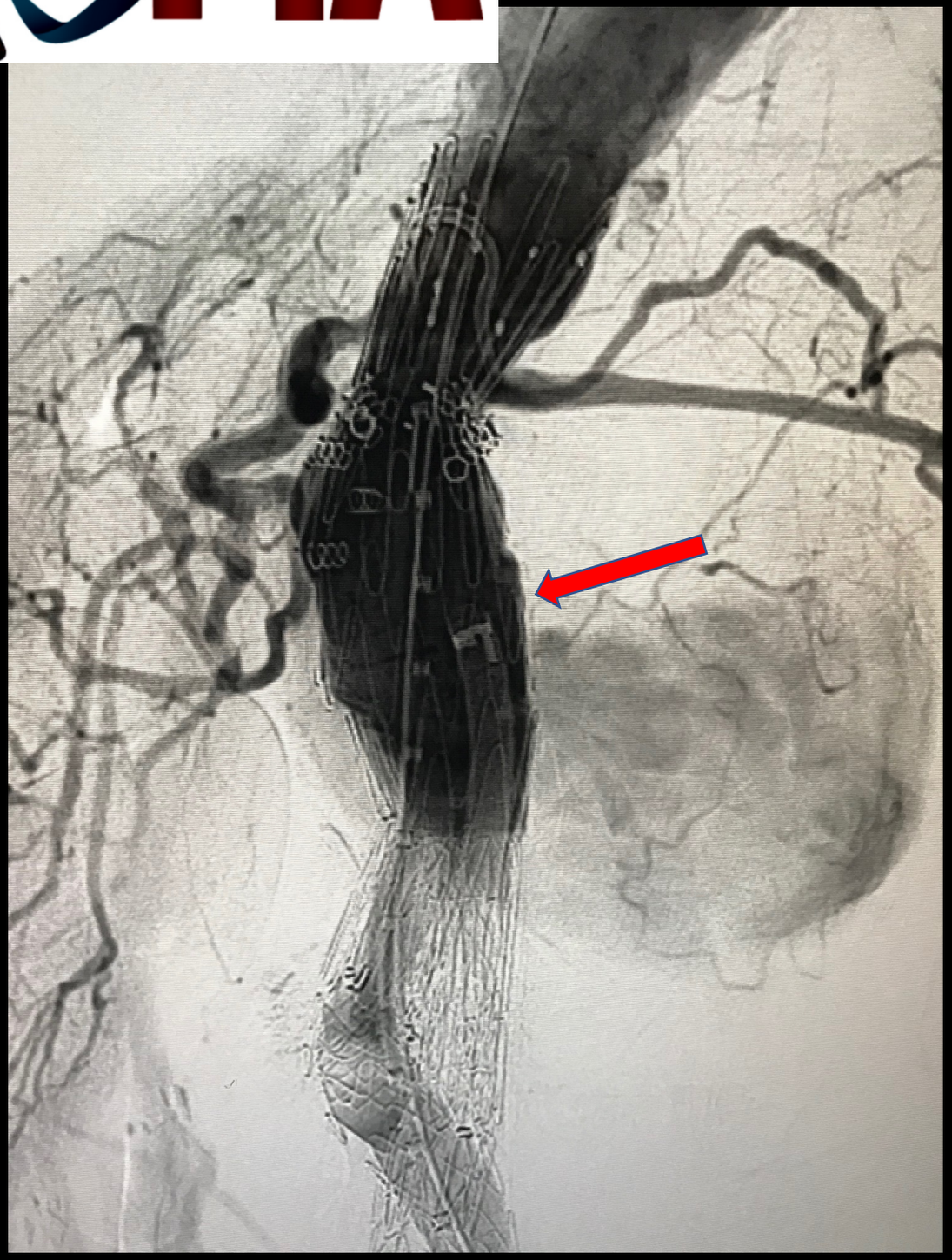

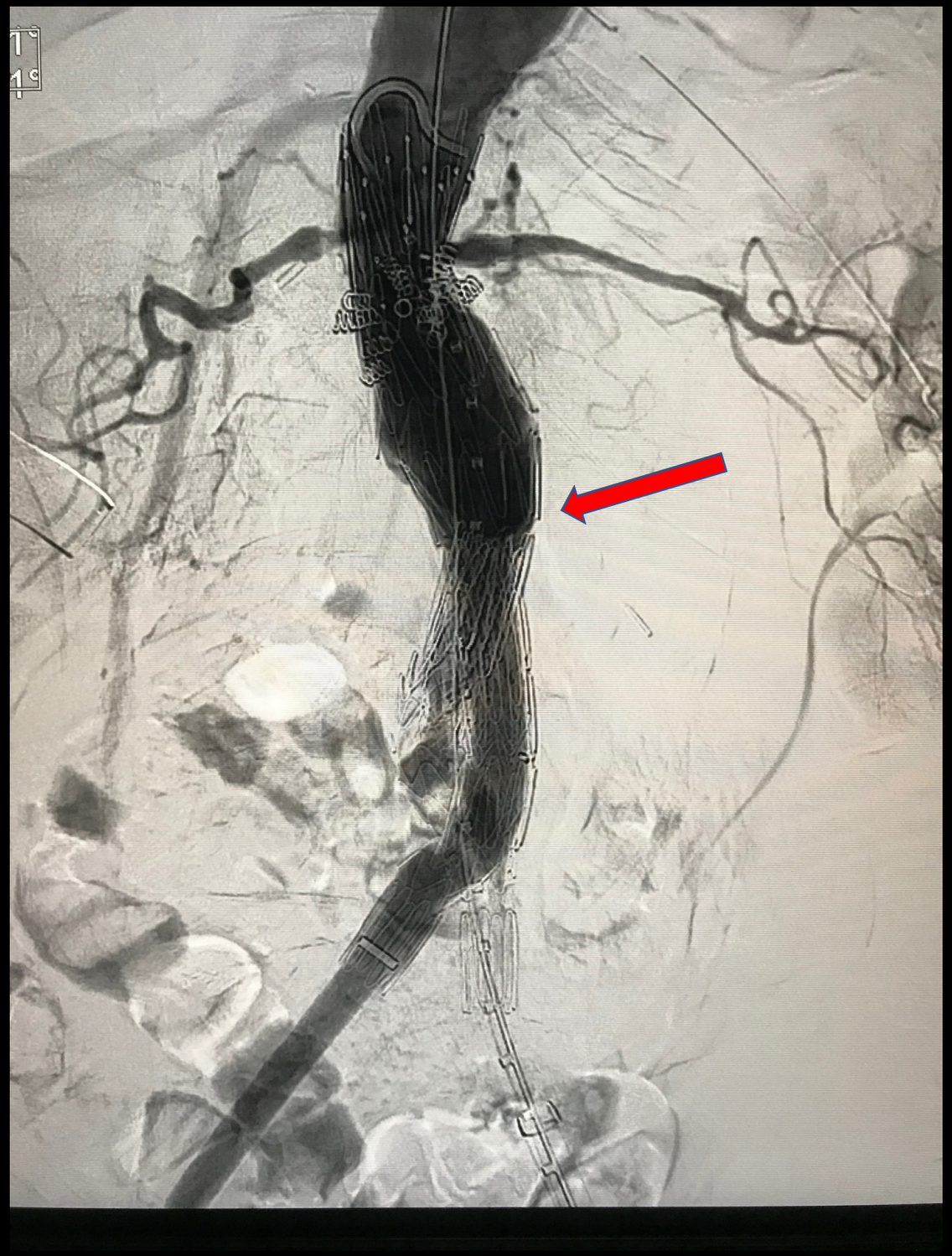

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A week later (7 weeks postop) died from MI while recovering in SNF

CONCLUSIONS

Hybrid angiography + limited open conversion after failed EVAR for T1EL can be achieved using interrupted horizontal sutures along proximal neck

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This limits physiological stress normally associated with secondary conversion: avoids aortic cross clamping, extensive dissection and associated EBL

Successful EL treatment is achieved without ARF (known after supra-renal aortic-cross clamping)

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